

REQUEST FOR RECONSIDERATION

Claims 1-11, 13-15, 30, 32, 34 and 36-41 are active in the present application. The claims are not amended in the present response to the Office Action of September 28, 2004.

Applicants thank Examiner Vo for the helpful and courteous discussion of September 27, 2004. During the discussion, Applicants' U.S. representative presented arguments that the term "point contact" recited in the present claims is defined by the specification to be different from generic point contact.

The Office maintained the rejection of the Office Action of April 21, 2004 wherein it was asserted that the present claims are obvious over Miwa (U.S. 4,851,304) in view of Koschany (U.S. 6,183,898) and further in view of one or more additional prior art references. In the "Response to Arguments" section of the Office Action of September 8, 2004, the Office appears to assert that the term "point contact" of present independent Claim 1 may not distinguish the claimed invention from the prior art binder-coated cloths, woven fabrics or sheets. It appears that the Office is of the belief that the term "point contact", as used in the present claims and present specification, includes any binder-coated cloth or woven fabric having fibers which make contact with one another (e.g., generic point contact).

Applicants submit that the present specification contains disclosure that serves to define that the term "point contact" of the present claims may be the contact that occurs between fibers of woven fabrics through a binder present only at the intersection or contact points of fibers of, for example, a woven fabric. This disclosure further serves to distinguish the invention "point contact" from the prior art generic contact wherein the binder may be present over the entire surface of the fibers which make up the woven fabric.

A prior art woven fabric is described in the paragraph bridging pages 5 and 6:

Japanese Patent Laid-Open No. 261421/1998 discloses a technique in which a layer comprising a fluororesin and carbon black is formed on a surface of a carbonaceous-fiber woven fabric. However, these techniques have a drawback that they

reduce gas-diffusing properties, which are an advantage of carbonaceous-fiber woven fabrics.

Therefore, in the "Background of the Invention" section of the present specification Applicants have described a prior art woven fabric which has a fluororesin coating present on the surface of the fibers of the woven fabric. It is explicitly stated that this prior art woven fabric has a disadvantage because the presence of the coating on the fibers of the prior art woven fabric reduces the gas-diffusing properties of the woven fabric. This makes logical sense when one considers that a woven fabric may have a lower pore size if the fibers are coated with a binder or other material. In such a situation the binder may act to increase the surface area of the fibers and thereby decrease the pore size which results in a restricted passage of gas through the pores of the woven fabric.

When bonding the fibers of a woven fabric to one another with a binder or a product of carbonization of a binder, it is important to take care to prevent the binder from filling the pores of the woven fabric. As mentioned above, the presence of a binder in the pores of the woven fabric may reduce the gas-diffusing properties of the woven fabric (page 25, lines 4-11):

Namely, it is preferred to use... (2) a technique which the carbonaceous filters are brought into discontinuous point contact with one another with a relatively large amount of a binder or a product of a carbonization thereof (page 25, lines 14-23).

Applicants have therefore recognized the problem of decreased gas-diffusing properties in prior art woven fabrics that are coated with a resin material. Applicants have disclosed a solution to the problem of the prior art woven fabrics. In one embodiment of the invention, Applicants have claimed a sheet that has fibers bonded to one another through a binder by "point contact." As mentioned above the "point contact" of the present claims is not the same as the generic contact of the prior art.

In one aspect of the invention, the “point contact” structure of the claimed sheet is obtained by treating a woven fabric with a dispersion containing resin (i.e., binder) particles. The woven fabric which is obtained in this way may overcome the disadvantages of the prior art by providing a different contact structure between the fibers of the woven fabric (e.g., discontinuous point contact).

The process used by Applicants in one embodiment of the invention to provide a woven fabric having point contact between the fibers of the woven fabric is described in the paragraph bridging pages 27 and 28 of the specification. This disclosure is reproduced in part below for convenience:

The technique (2), in which carbonaceous fibers are brought into discontinuous point contact with another with a binder or a product of carbonization thereof, may be conducted in the following manner. First, a thermosetting resin such as... is preferably selected as the binder or a material for carbonization product. In order to attain a discontinuous point contact, this thermosetting resin is sprayed over or applied to the carbonaceous-fiber sheet in the form of a dispersion of fine semicured resin particles having an average particle diameter of generally 3 μm or larger... this sheet is suitably dried and pressed, and is then heated to completely cure the resin and thereby obtain the conductive carbonaceous-fiber woven fabric.

In the process described in the paragraph bridging pages 27 and 28 of the specification, Applicants disclose exposing a woven fabric a dispersion that contains “semicured resin particles.” The process provides a woven fabric having discontinuous point contact.

Applicants submit that those of ordinary skill in the art readily recognize that the prior art woven fabrics which may be prepared by dipping the fabric into a solution of a resin and a solvent, would inherently coat the entire surfaces or substantially the entire surfaces of the fibers which make up the prior art woven fabric. In contrast, to the liquid resin solution used in the prior art process to prepare the prior art woven fabric, the process of using the invention dispersion provides a sheet where the binder is discontinuous over the fiber

surfaces and is present as cured particles at certain points on the fibers where fiber sections meet.

Applicants submit that those of ordinary skill in the art may recognize that even though the technique described in the paragraph bridging page 27 and 28 of the specification may coat the entire surface of a woven fabric with the dispersion, only certain portions of the woven fabric will be in contact with a binder because only the portion of the fibers that are in contact with the particles of the dispersion will remain adhered to binder.

It is disclosed in the paragraph bridging pages 29 and 30:

The cloth with enhanced stiffness obtained by using such a *semicured thermosetting resin* as a binder is preferred in that the increase in electrical resistance caused by a resin which not only bonds carbon fibers to one another but covers the surface of the fibers, as in the case of a liquid phenolic resin, is little in that cloth because *the semicured resin can bond the carbonaceous fibers to one another through "point contact"*.

The above paragraph indicates that the resin used to prepare a conductive carbonaceous-fiber sheet may be a thermosetting resin. The thermosetting resin may be applied to cover the surface of the fibers and when used in this way the increase in electrical resistance "is little". This paragraph also mentions woven fabrics contacted to one another through "point contact" and indicates that in such a woven fabric the increase in electrical resistance "is little". This paragraph serves to evidence that the specification as originally filed discloses two different types of woven fabric having a resin.

In one type (e.g., one that may be obtained by coating with a liquid phenolic resin) the resin may cover the surface of the fibers. In another type (e.g., one obtained by coating with a dispersion of semicured resin particles) the fibers bond to one another through "point contact" and have surfaces which are covered with the binder where the fibers contact a particle of the binder. Therefore, the specification as originally filed distinguishes between two different structures, one obtained by contacting a woven fabric with a liquid phenolic

resin having a coating over the surface of the fibers and another structure obtained from a semicured resin that contacts the fibers through point contact where the fibers are not completely coated with the binder.

This distinction is further supported by the Examples. Example 8 on page 40 of the specification describes the preparation of a conductive carbonaceous-fiber woven fabric made by technique (2) described in the specification on pages 27 and 28. A woven fabric is exposed to an aqueous dispersion of a semicured phenolic resin. The phenolic resin is present in the aqueous dispersion in an average particle diameter of 20 μm . The resulting woven fabric is shown in high magnification in Figure 2 of the drawings. Inspection of Figure 2 shows that the binder does not cover the surfaces of the fiber but instead is present only at the point where the particle of the semicured thermosetting resin is present. Thus the “point contact” described in original Claim 12 is implicitly defined in the specification as contact between fibers that occurs locally by covering only a portion of the fibers’ surface with a coating and the coating is not present over the entire surface of the fibers.

Figure 1 of the drawings shows a portion of a woven fabric that is obtained by immersing the woven fabric in a liquid solution of a resin. Close comparison of Figures 1 and 2 of the drawings shows that Figure 1 has a fiber surface that is smoothed in comparison to Figure 2 and may therefore be covered with cured phenolic resin. Even though the resin applied to the woven fabric of Figure 1 may not bridge each fiber entirely, the resin is present over substantially the entire surface of the fibers and may thereby change the pore size and gas-diffusing properties of the woven fabric.

Applicants therefore submit that the specification as originally filed distinguishes the term “point contact” from generic point contact. The invention “point contact” describes a structure of a woven fabric structure having a binder coating over substantially all of the surfaces of the fibers that make up the woven fabric. In comparison the invention woven

fabric has a structure where bonding between fibers and the presence of a resin is restricted to certain points and the binder coats the fibers only at the point where the binder particle touches the fibers.

Applicants have chosen to use the term “point contact” to identify only woven fabrics where only a portion of the fibers of the woven fabric are in contact with a binder. Applicants submit that use of the term “point contact” to describe contact between fibers (or carbonized fibers) that occurs through a point of binder that does not cover the entire surface of the fibers (e.g., is discontinuous) is not repugnant to the art (see MPEP §608.01(o)).

“During patent examination, the pending claims must be “given their broadest reasonable interpretation consistent with the specification.”” MPEP §2111.01 (citing to *In re Hyatt*, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000)). “[The] PTO applies to verbiage of the proposed claims the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in applicant’s specification.” *In re Morris*, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Applicants submit that the present specification provides guidance with regard to the meaning of the term “point contact” and further that the term “point contact” is different from generic contact.

Applicants therefore submit that the use of the term “point contact” in the claims of the present application and as described above is consistent with the meaning put forth in the specification.

With regards to the rejection of Claim 13 which is written in a product-by-process format, Applicants submit that the subject matter of Claim 13 is patentable over the prior art of record as evidenced by Figures 1 and 2 of the specification. It is evident from a comparison of Figure 1 and Figure 2 that a process where a woven fabric is contacted with a

liquid resin coats the entire surface of the fiber with the resin. In contrast a process that contacts a woven fabric with a dispersion of resin particles coats the fibers only at the point where the particle of the semicured resin contacted the fibers and is not present over the entire surface of the fibers. Applicants have therefore shown that there is a structural difference in the woven fabric obtained by a process according to the process recited in Claim 13 and further submit that this difference distinguishes the subject matter of Claim 13 over the prior art relied upon by the Office.

With regards to the rejection under 35 U.S.C. § 112, Applicants traverse the Office's assertion that this subject matter is not described in the specification. Applicants point to Example 8 of page 40 of the specification wherein a woven fabric is contacted with a dispersion of semicured phenolic resin. Applicants submit that those of ordinary skill in the art readily recognize that a phenolic resin may not be soluble in an aqueous matrix and will therefore form two phases, including an aqueous phase and a phase of the phenolic resin. It is explicitly disclosed in Example 8 that the phenolic resin is present as particles and the particles have an average particle diameter of 20 μm . The woven fabric obtained by Example 8 is shown in Figure 2 of the drawings. Figure 2 shows two fibers contacted at a point through a bridge formed by the adhesion of a particle of the semicured phenolic resin between the two fibers. Therefore, the point contact of the woven fabric shown in Figure 2 is a particle of thermosetting resin. Applicants respectfully submit that the rejection under 35 U.S.C. § 112, first paragraph is not sustainable and should be withdrawn.

Applicants submit the presently claimed invention is not obvious in view of the prior art relied upon by the Examiner as supported by the comments above. Applicants respectfully request the withdrawal of the rejections and the passage of all now-pending claims to Issue.

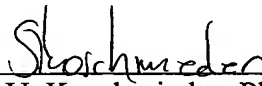
Respectfully submitted,

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